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"Mister Los Alamos"

A presentation discussing Norris Bradbury and his time as the director of the Laboratory. The talk is a historical presentation by Alan Carr.

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# NATIONAL SECURITY RESEARCH CENTER







# “Mister Los Alamos”

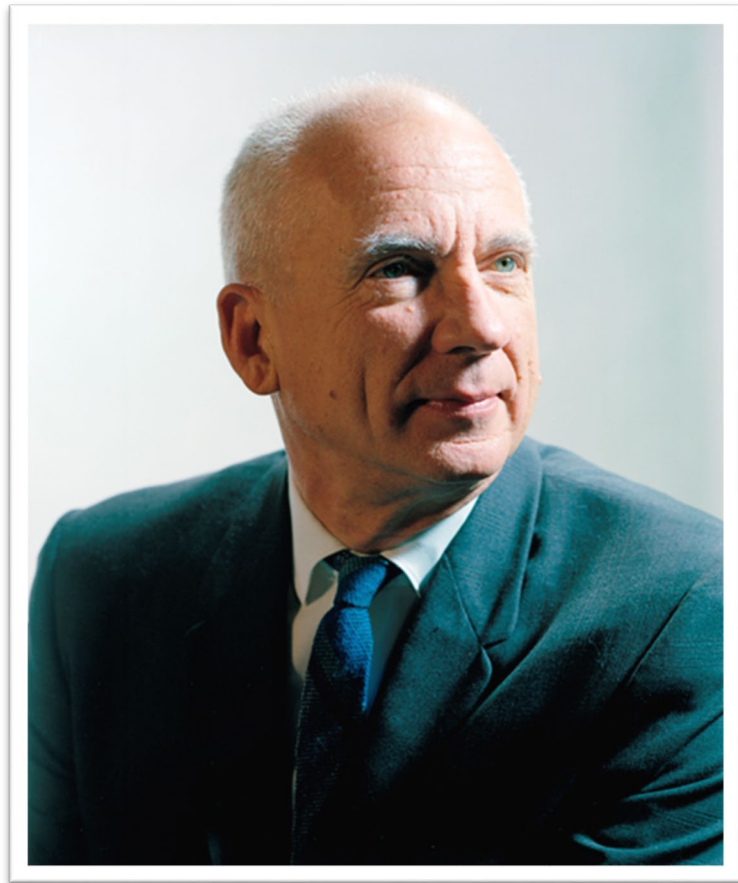
The Life, The Times and The Laboratory  
of Norris E. Bradbury

NATIONAL SECURITY  
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**Alan B. Carr**  
NSRC Senior Historian  
WRS-SIS Program Manager

# Who was Norris Bradbury?

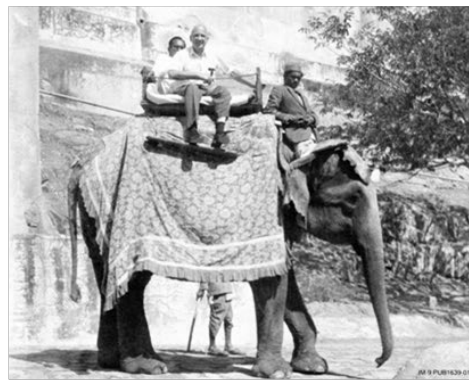


- Summa cum laude graduate of Pomona College
- National Research Council Fellow
- Naval Reserve officer
- Berkeley-trained physicist
- Stanford professor
- Wartime Group Leader
- Member, National Academy of Sciences
- The "Savior" of Los Alamos
- The "Architect" of the modern Laboratory
- "Mister Los Alamos"

# And also ...



Skilled woodworker  
Gardener  
Amateur archeologist  
Mechanic  
Avid reader  
World traveler  
Family man





# What was he really like?



"He lived as though he were killing snakes every minute of the day."

"Whatever he was doing, it was always zip, zip, zip."

"He was a nice man; both fair and honest."

"He was careful and conservative."

"He was very calm and collected."

"He was not flamboyant."

"He was easy to like."



"He was patient – even with Edward Teller."





“He had little patience for the perks of top management. His office was strictly functional; no carpeting, no lounge chairs, simply GI office furniture. There were no reserved parking areas for individuals. His usual attire was casual; in fact, if he appeared for work in a business suit it meant he was expecting VIPs or that he was about to leave on official business. His office door was open all day, except when he was in conference. He answered his phone himself unless he was already on the line. For a number of years he drove a battered Model A Ford coupe with a rumble seat, and warned passengers to beware of the insecure door locks and the holes in the floorboards. He eventually donated the car to the high school student shop to use for repair practice.”



# The Early Years



- Norris Edwin Bradbury was born May 30, 1909 in Santa Barbara, California
- His mother, Elvira, was a teacher
- His father, Edwin, was an electrician, gardener, landscape architect, vinedresser, rancher, machinist, and stamp collector
- Bradbury's sister died as an infant; his parents adopted twins
- He attended Hollywood and, later, Chaffey Union High Schools
- He was 16 years old when he graduated



# Norris Goes to College



- Bradbury was a member of Phi Kappa Alpha
- In 1929, he received his B.A. in chemistry from Pomona College
- His dissertation was on the mobility of ions in gases
- In 1932, he received his Ph.D. in physics from Berkeley
- Bradbury studied under Professor Leonard B. Loeb
- He won Whiting and National Research Council Fellowships
- In 1933 and 1934, he studied at MIT

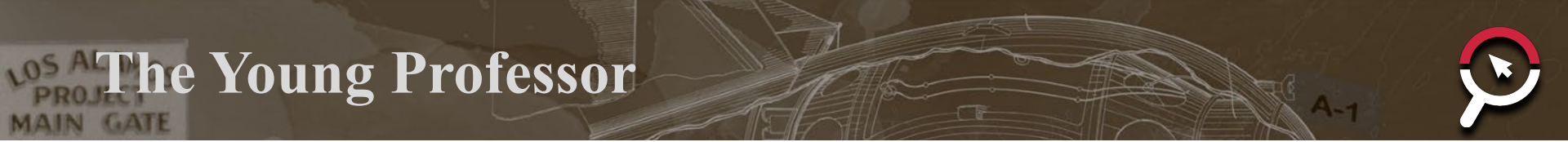






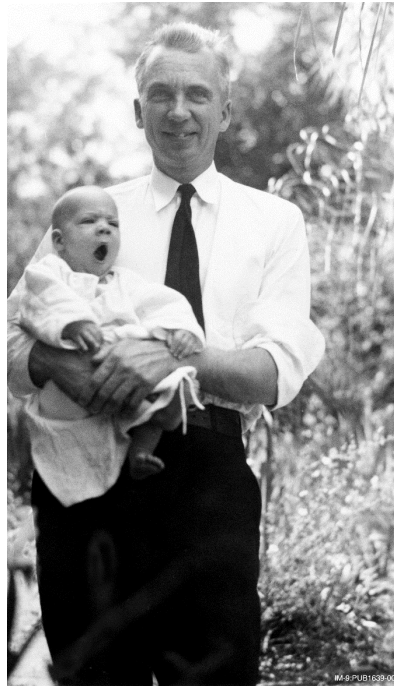
*Lois was the sister of my roommate in college. She was engaged to someone else. The engagement fell apart and I moved in.*

- In 1933, Bradbury married Lois Platt
- Norris and Lois had been married 64 years when Norris passed away
- They had three sons: James (Jim), John and David
- Loeb, a former naval reserve officer, encouraged him to apply for a commission
- Bradbury became an ordnance specialist in the early '30s
- LCDR Chester W. Nimitz signed Bradbury's commission

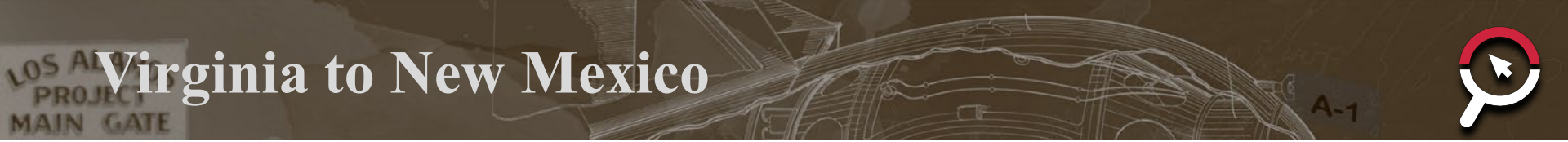


# The Young Professor

- In 1935, Bradbury was named assistant professor of physics at Stanford
- By then, he had published numerous articles in prestigious publications
- He was an expert on the conduction of electricity in gases, ion properties and atmospheric electricity
- In early 1941, Bradbury was called to active duty
- He studied the exterior ballistics of Naval projectiles

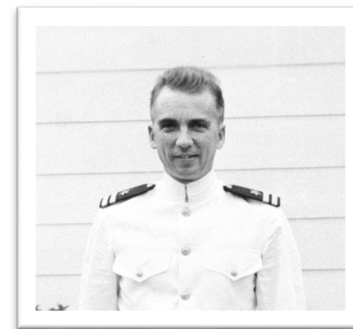


*The first round from a gun might be its last, and it was necessary to hit the target the first time.*



# Virginia to New Mexico

- Bradbury was assigned to the Naval Proving Grounds at Dahlgren, VA
- At Dahlgren, he worked with Loeb and Capt. William Parsons
- In 1943, Parsons left for Los Alamos
- About a year later, Parsons offered Bradbury a job at the Lab
- After some initial hesitation Bradbury accepted the offer



*...My conscience got the better of me. I got to thinking about the blue uniform I was wearing, and who was I to argue about where I was assigned? I called Parsons and told him I'd take the job.*



# Project Y

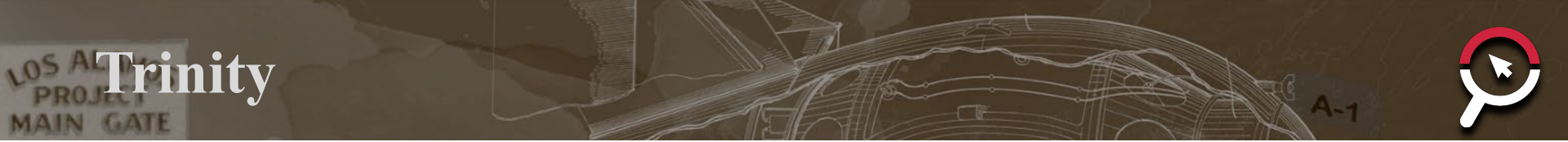


*I guess I was picked for the project because I had worked with Parsons, had had some chemistry, was a physicist, I knew a little about nuclear physics and I had had some ordnance experience at Dahlgren.*

- The Bradbury family lived in a Sundt apartment and later a Bathtub Row home
- Bradbury served as group leader for:
  - E-5, Implosion Experimentation
  - X-1, Implosion Research
  - X-6, Assembly and Assembly Tests
  - Z-1, Experimental Systems







# Trinity

- Bradbury assembled the Trinity device's non-nuclear components
- He also devised procedures for transporting and assembling the Gadget
- The test was successfully conducted July 16, 1945
- It achieved a yield of 21 kilotons

Saturday, 14 July, 1700

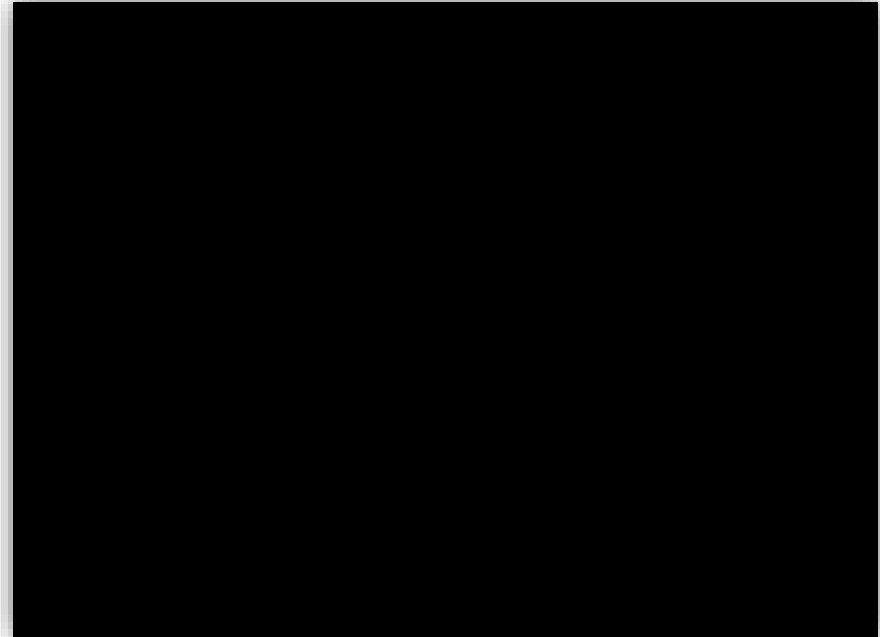
Gadget complete

Sunday, 15 July, all day

Look for rabbit's feet and four leafed clovers.  
Should we have the Chaplain down there?  
Period for inspection available from 0900-1000

Monday, 16 July, 0400

BANG!



*For me to say I had any deep emotional thoughts about Trinity, I didn't. I was just damned pleased that it went off.*

# The End of World War II



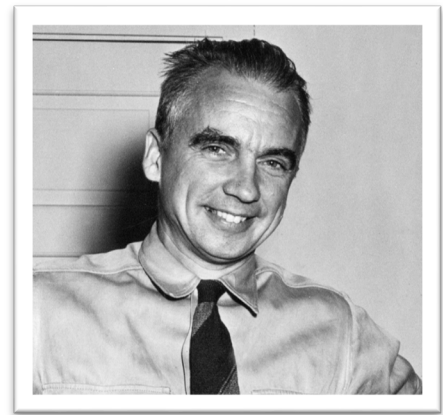
- Hiroshima was bombed August 6, 1945
- 64,500 had died by mid-November 1945
- On August 8, the Soviet Union declared war on Japan
- Nagasaki was bombed on August 9
- 39,214 had died by mid-November 1945
- On August 14, an armistice was declared
- The official surrender came aboard the USS Missouri in Tokyo Bay on September 2
- Los Alamos received the Army-Navy "E" Award for excellence in wartime production on October 16





# Oppenheimer's Successor

After the war, approximately half the Los Alamos staff left;  
Oppenheimer resigned as director in early fall 1945;  
Groves and Oppenheimer wanted Bradbury to take the helm ...  
*... but they didn't bother to consult the University of California!*  
Bradbury reluctantly agreed to serve for six months.



“After much thought and considerable discussion with Oppenheimer and others, I asked Dr. Norris Bradbury to take the position.

Bradbury had spent several years at Los Alamos and had played an important part in the development of the gun-type bomb [sic]. Also, he was a Navy reserve officer, a circumstance I thought would help him in maintaining smooth relations between the civilian scientific staff and the military administrative officers.”

General Leslie R. Groves



“...The decision as to whether or not and when the University [leaves the project] would not at all be based on Dr. Bradbury's opinion, for he had never really been our employee and had no administrative touch with the University and the controlling board. In fact, his methods of administration in many respects are not along lines approved or developed by the University.”

Robert M. Underhill  
Secretary-Treasurer for the UC Board of Regents



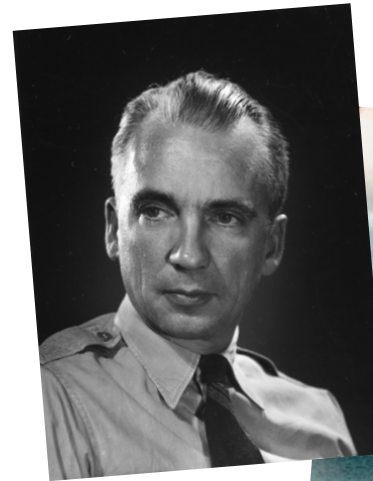
# The Fortunate Visionary



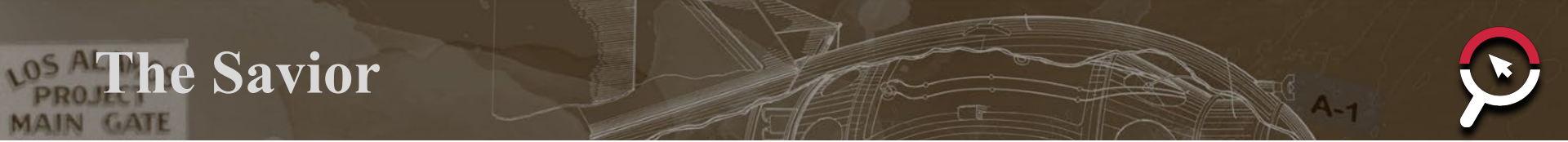
- Bradbury spent a lot of his time struggling with domestic emergencies
- He also created a future for the Lab:
  - 1.) We will set up the most nearly ideal project we can.
  - 2.) We will not discontinue weapon research until it is clearly indicated that this can be done.
  - 3.) We will decrease the project in size so that it can be accommodated on the mesa on a civilian basis.
- Operation CROSSROADS provided the Lab with a reprieve (though Bradbury and Groves were not big fans of the operation)

“If Norris hadn’t stayed ... I think the Lab would have collapsed.”

Richard Baker  
Laboratory Associate Director



*What held the place together was the Navy’s program to determine the effects of nuclear bombs against naval vessels.*



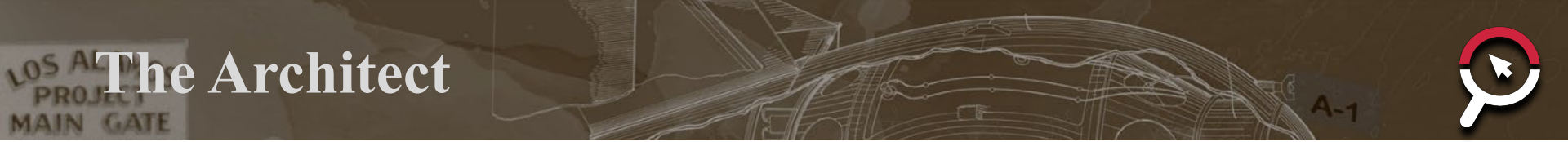
# The Savior

- Bradbury successfully collaborated with Groves
- True to his plan, he began building his ideal Laboratory
- He convinced the Atomic Energy Commission (AEC) to adopt his plans for Los Alamos
- Gradually, Bradbury also won the confidence of the UC Board of Regents
- During this time, the Lab refined fission weapons and continued research on the Super



“In early 1947, at least a substantial minority of the [AEC’s General Advisory Committee] believed that neither Los Alamos nor Norris Bradbury would long be on the atomic energy scene.”

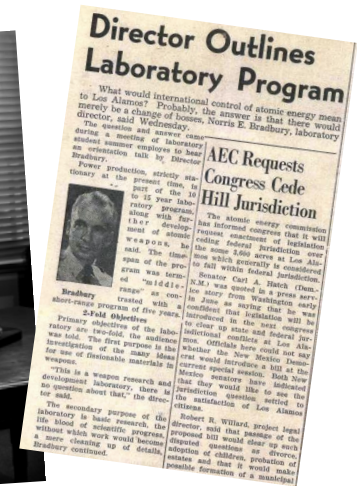
Glenn T. Seaborg  
AEC Chairman and 1951 Nobel Laureate



# The Architect

- The Lab's future started to solidify in the later 1940s
- The AEC rapidly expanded Bradbury's budget
- \$100 million was secured to rebuild the technical area in the later 1940s
- There was also a \$7 million housing project
- The "tree-shaking" statement
- Bradbury befriended Underhill and worked with him on UC contract extensions

*When I made my 'six months' statement upon becoming Director, I didn't think I wanted to be the Director; I thought I wanted to get out.*

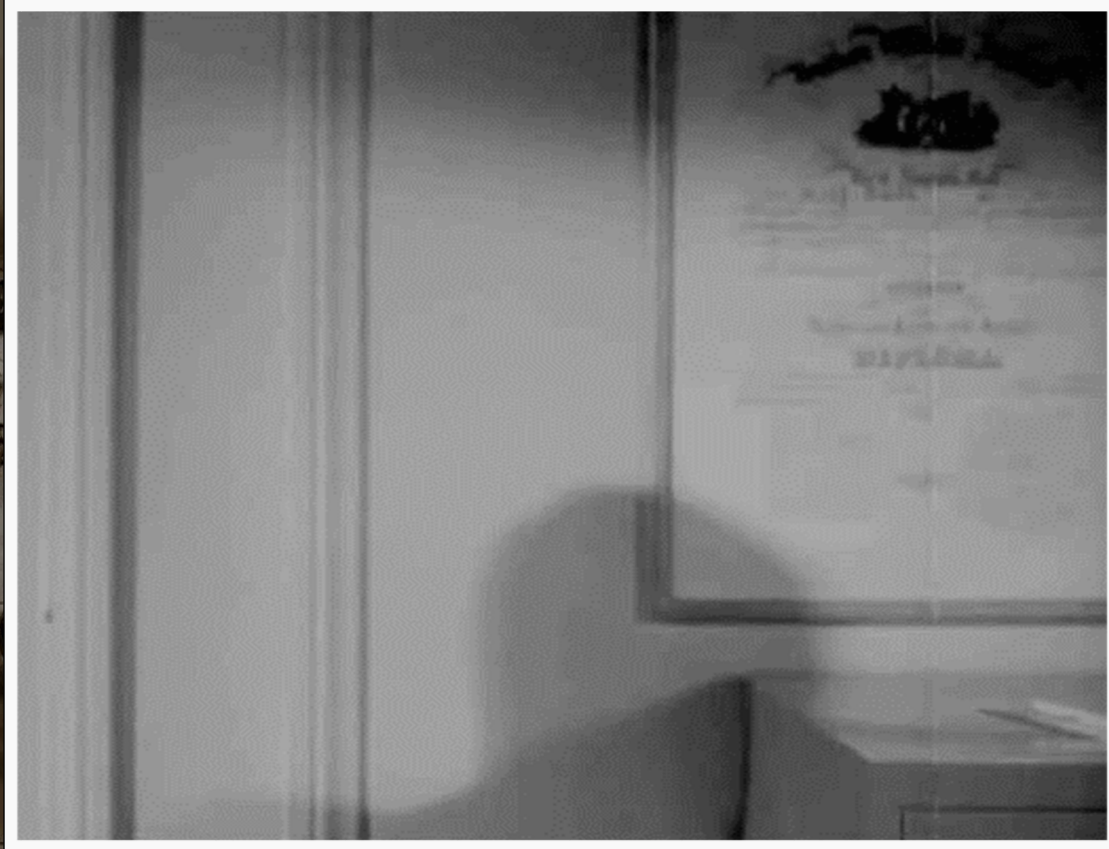


*But I decided I couldn't run a laboratory that would have a future unless I was willing to put my own future on it. It needed a man that believed in it himself before others could believe in it.*



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# “C” is for Communism



# The Cold War Escalates



- The Soviets had a pre-war history of aggression
- The Berlin Blockade: June 1948 to May 1949
- The first Soviet atomic bomb was tested in August 1949
- 1950 witnessed the end of the Chinese Civil War and the beginning of the Korean war
- A Soviet spy ring operating in the U.S. was exposed in 1950
- In the later 1950s, public fears were stoked by the Bomber Gap, the Missile Gap and Sputnik



THE EFFECT OF THE SOVIET POSSESSION OF ATOMIC BOMBS ON THE SECURITY OF THE UNITED STATES



POSSIBILITY OF DIRECT SOVIET MILITARY ACTION DURING 1948

"The Strategic Value to the USSR of the Conquest of Western Europe and the Near East (to Cairo) prior to 1950."





# Norris Bradbury: Cold Warrior



*To bring peace by threatening war  
is possible; to bring peace by  
requesting and promising  
cooperation seems more dignified.  
But the request and the promise,  
and surely the threat, are both  
fortified by weaponeering now.*



*One hopes that weapon emphasis  
will decrease with time. We are  
not a warring nation – the mere  
possession of weapons does not  
bring about war.*

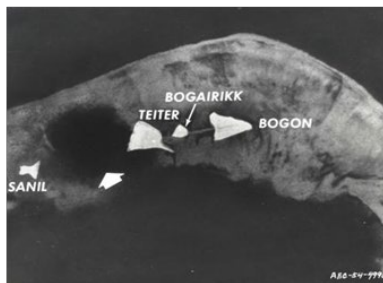
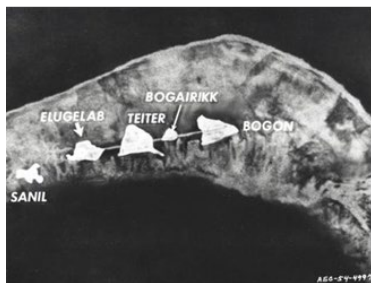


*I, myself, with considerable  
knowledge of nuclear things, with  
some knowledge of their military  
use, but with only a plain citizen's  
feelings about people and nations  
and hopes and fears would prefer  
to try to follow the path of hope.*

# The Hydrogen Bomb



*Thermonuclear work  
never stopped.*



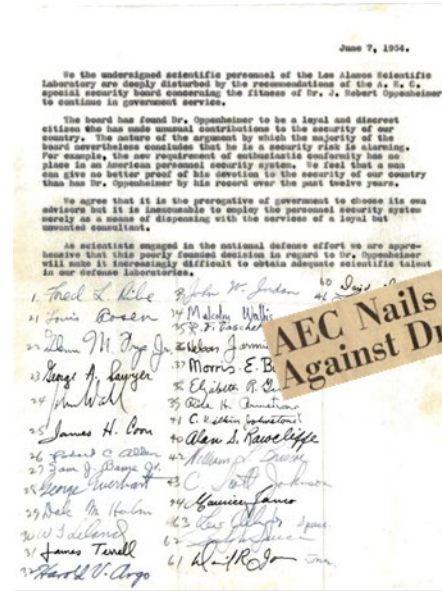
- Wartime Super research continued and expanded with the Lab
- After the war, the MANIAC computer was developed for hydrogen bomb research
- President Truman ordered research to accelerate in the months following Joe-1
- In response, Bradbury decided to put the Lab on a six-day work week
- Mike achieved a yield of 10.4 Mt on Oct. 31, 1952



# In the Matter of J. Robert Oppenheimer



- Bradbury did not publicly take sides during the hearing
- The Laboratory overwhelmingly supported Oppenheimer
- Bradbury testified in Oppenheimer's defense on April 22, 1954
- He argued that Oppenheimer did not hinder H-Bomb research
- The AEC chose not to reinstate Oppenheimer's clearance
- More than 500 Los Alamos employees protested the decision

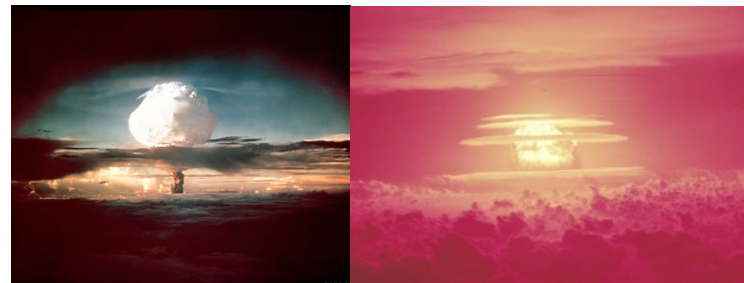


*I never saw a man in my life more fanatically dedicated to his country. And one can be dedicated to one's country without agreeing with everything his country does.*

# The 'Golden Age' of Nuclear Weapons R&D



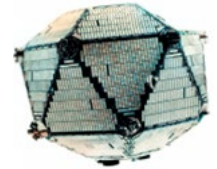
- The nation's stockpile grew from two to 31,255 weapons between 1945 and 1967
- During that same time, the United States conducted more than 500 nuclear tests
- The first full-scale hydrogen bomb test was conducted on October 31, 1952
- The first tactical nuclear weapon was tested in May 1953
- CASTLE-Bravo, the nation's largest test, achieved a yield equal to 15 million tons of TNT (1,000 Little Boys)



# An Expanding Mission



- In the late 1950s, the Laboratory began to diversify its mission
- Research initiatives came to include



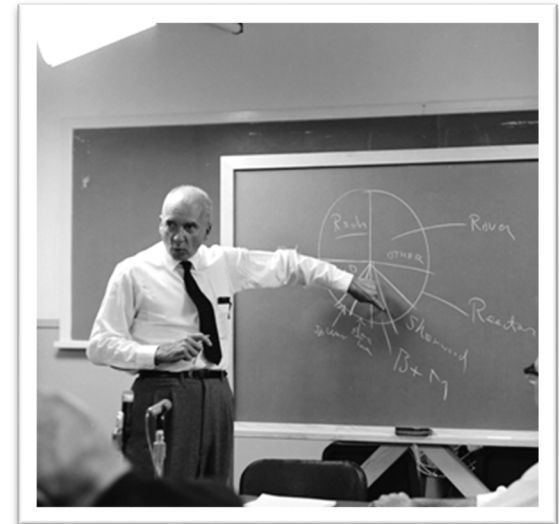
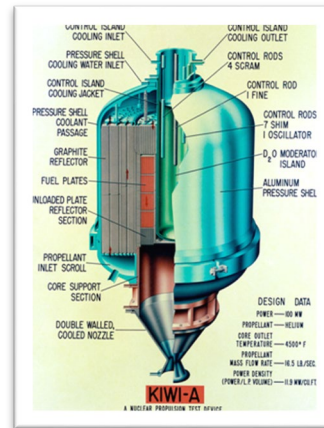
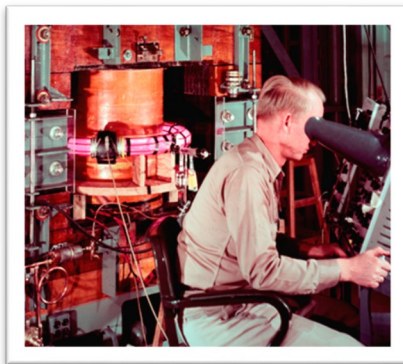
The development of nuclear powered rockets for space exploration (Rover)

Industrial applications for nuclear explosions (Operation Plowshare – mostly Livermore)

Controlled thermonuclear fusion research (Sherwood)

The development of nuclear verification technologies (Vela)

Subatomic exploration (LAMPF)







# The Cold War Nearly Turns Hot

- May 1, 1960: A U.S. spy plane was shot down over the Soviet Union
- April 12, 1961: Yuri Gagarin became the first person to visit outer space
- Only five days later, the Bay of Pigs Invasion of Cuba unfolded ... *and promptly failed*
- Construction on the Berlin Wall began in August 1961
- The Soviets abrogated the testing moratorium on Sept. 1, 1961
- Sept. 15, 1961: The U.S. resumed testing
- The Tsar Bomba was tested Oct. 30, 1961
- October 1962: The Cuban Missile Crisis



# Bradbury's Final Decade as Director



- The Laboratory struggled with budget problems starting in the mid-1960s
- A complete test ban also seemed like a real possibility
- Despite arms treaties, the U.S. conducted 428 tests in the 1960s
- By 1970, there were 4,000 Lab employees and the annual budget was \$100 million

*The post-war years may have been the golden age for science and scientists and we may or may not have deserved it. Now maybe we're in the iron age. But, we still have it pretty damned good.*



# A Quarter Century of Innovation



**1946:** The Monte Carlo method devised

**1946:** The world's first plutonium-fueled reactor completed

**1951:** First underground nuclear test conducted (according to DOE)

**1951:** First nuclear test producing thermonuclear burn conducted

**1952:** The world's first full-scale hydrogen bomb test conducted

**1953:** The world's first tactical nuclear weapon tested

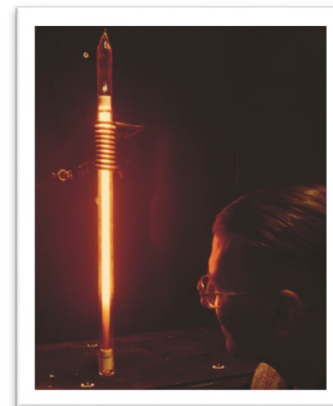
**1954:** The largest U.S. nuclear test conducted

**1956:** The existence of the neutrino proven

**1963:** The heat pipe is invented

**1963:** First Vela satellites launched

**1967:** Gamma-ray bursts are first detected





# Celebrating a Unique Career



- On August 29, 1970, Seaborg presented Bradbury with the AEC's Enrico Fermi Award

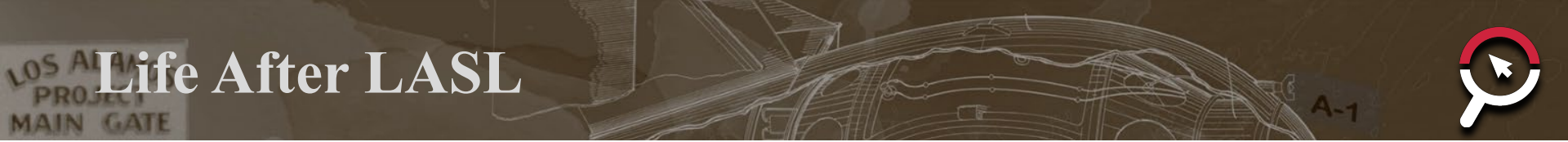


- The Museum and Science Hall was renamed in his honor shortly after his resignation
- Harold Agnew succeeded Bradbury on September 1, 1970

*When a man says he's going to retire you immediately start thinking about a rocking chair. I'm not ready for one.*







# Life After LASL

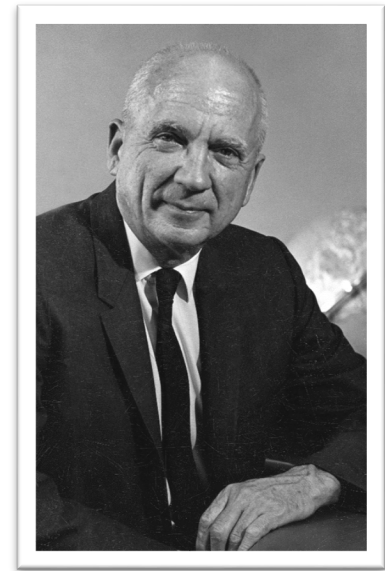
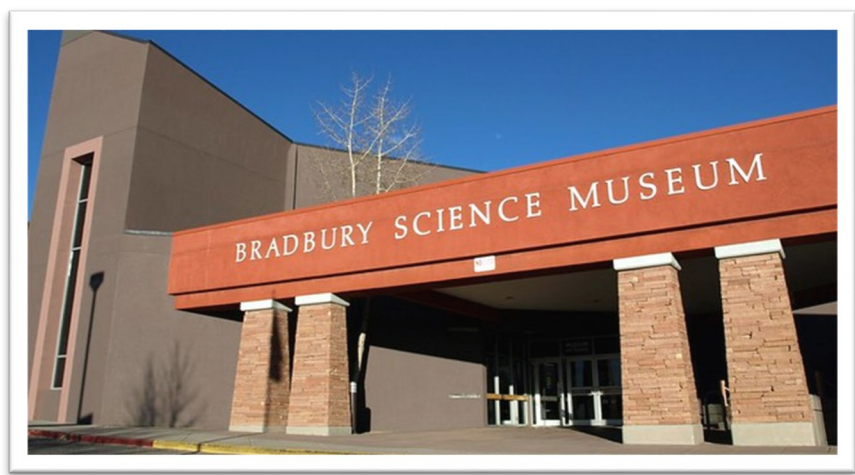
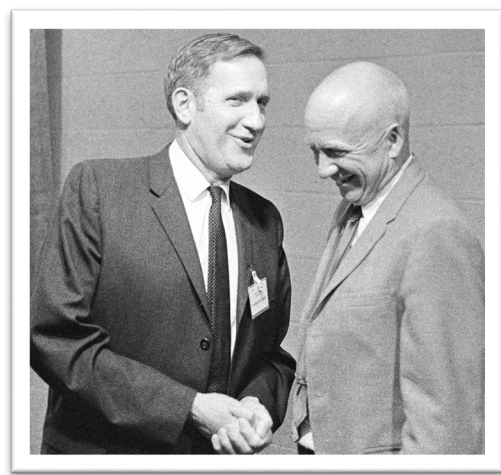
- Bradbury declined Agnew's offer to serve as an advisor
- He was a University of New Mexico regent from 1969-1971
- For many years, he was a member of the Episcopal parish vestry
- He continued to make furniture and traveled extensively
- In his final years, he suffered from many health problems
- Norris Bradbury passed away August 20, 1997





# The Legacy of Norris E. Bradbury

- Bradbury considered nuclear weapons a necessary but temporary evil: “Nobody likes atomic bombs; I hate them. But it has to be done ...”
- To maintain a thriving weapons program, he diversified the mission of the Laboratory
- Bradbury also believed diversification would make the Laboratory a permanent asset to the nation
- Bradbury has been called the father of the federal Laboratory system





*“In contrast with almost every other field of human endeavor... the atomic bomb business seeks to put itself out of business. Our one objective at Los Alamos has always been that bombs never get used, that the United States was always ahead both in technology and a willingness to discuss the abandonment of nuclear warfare.”*

LOS ALAMOS  
PROJECT  
MAIN GATE  
PASSE  
PRESE  
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A-1

PROHIBITION  
ON  
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